

## **RARE Project: Migration of PFOA and HFPO-DA from Contaminated Soils to Surface Water and Groundwater near Washington Works facility**

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- Rare Team Members

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## Washington Works Background & History

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- Built around 1949 – 1950 by DuPont, located 5 miles west of Parkersburg, WV on the SE bank of the Ohio River
- Teflon Manufacture began in 1951 and continues to present
- PFOA used in Teflon manufacturing process – used till 2013 when replaced by HFPO-DA (GenX) believed to be less toxic.
- In 2015, DuPont turned operation over to spinoff Chemours
- Chemours continues production of Teflon using GenX

## EPA's SDWA Enforcement Involvement

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- In 2001, EPA and other regulatory agencies received letter from attorney Robert Bilott represented cattle farmer alleged to have lost 200 head to contaminants leaching from DuPont landfill.
- Bilott's comprehensive document search revealed damning information about PFOA toxicity and what DuPont had known.
- Bilott's letter made a case that DuPont had violated several environmental statutes, including TSCA, CAA, CWA and SDWA.

## Emerging Research, DW Screening Levels, SDWA Order

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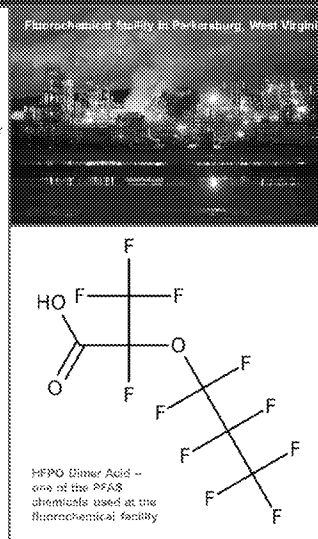
- 2002 - DW Screening Level - 150 ppb - 1<sup>st</sup> SDWA Order
- 2006 – DW Screening Level - 0.50 ppb – 2<sup>nd</sup> SDWA Order
- 2009 - DW Screening Level - 0.40 ppb - 3<sup>rd</sup> SDWA Order
- 2016 – LHA (PFOA + PFOS) - 0.070 ppb – amended Order

note: OW is in process of MCL development for PFOA and PFOS

## **Actions to Date by DuPont / Chemours**

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- Ten PWS in WV and Ohio provided with GAC treatment
- 140 private water supplies in WV and Ohio provided GAC
- 115 private water supplies hooked up to PWS
- Over 500 square miles of area impacted with PFOA > HA
- Continuing to monitor into new focus areas of concern
- Predominant mode of contaminant transport determined to be from air emissions



## GenX Monitoring

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- Since 2018, Chemours voluntarily monitoring for GenX in some public and private water supplies
- Eight water supplies closest to Washington Works indicate presence of GenX in the raw untreated ground water.
- GAC treatment is effective at removing GenX in finished water
- Chemours continues to monitor wells quarterly - GenX concentrations appear to be edging upward

## Other Activities not Addressed by SDWA Orders

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- Civil action settlement required large population toxicity study
- 70,000 population participated
- PFOA exposure related to 6 adverse health conditions
- EPA TSCA program penalized DuPont \$16 million for failure to report toxicity findings in timely manner
- DuPont agreed to undertake vast study of local impacts to soil, groundwater, vegetation, and uptake by animals and fish
- Two movies made in recent years about Washington Works facility and PFOA

## Regional Applied Research Efforts (RARE) Project

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- DuPont/Chemours enforcement matter motivated further research into PFAS and GenX
- EPA ORD leading with support from R3 & R5
- EPA will be coordinating overall effort, finalizing sampling plans, and conducting chemical analysis

\*introduce

\*as Chemours efforts were underway, EPA then started to consider if there was more research to be done re: PFAS & esp GenX. We needed to expand our understanding air emissions and soil deposition, what communities are being impacted, and the geographic reach of this kind of contamination.

This project was started to help advance the science and our understanding of PFAS and GenX

# Purpose of the RARE Project

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Primary objective = evaluate the migration of PFAS from contaminated soils to surface water, ground water, and vegetation in vicinity of Chemours facility

- Better understand the conditions that influence movement of PFAS from soils to surface and ground waters
- More fully characterize the geographic extent of contamination around PFAS manufacturing facilities

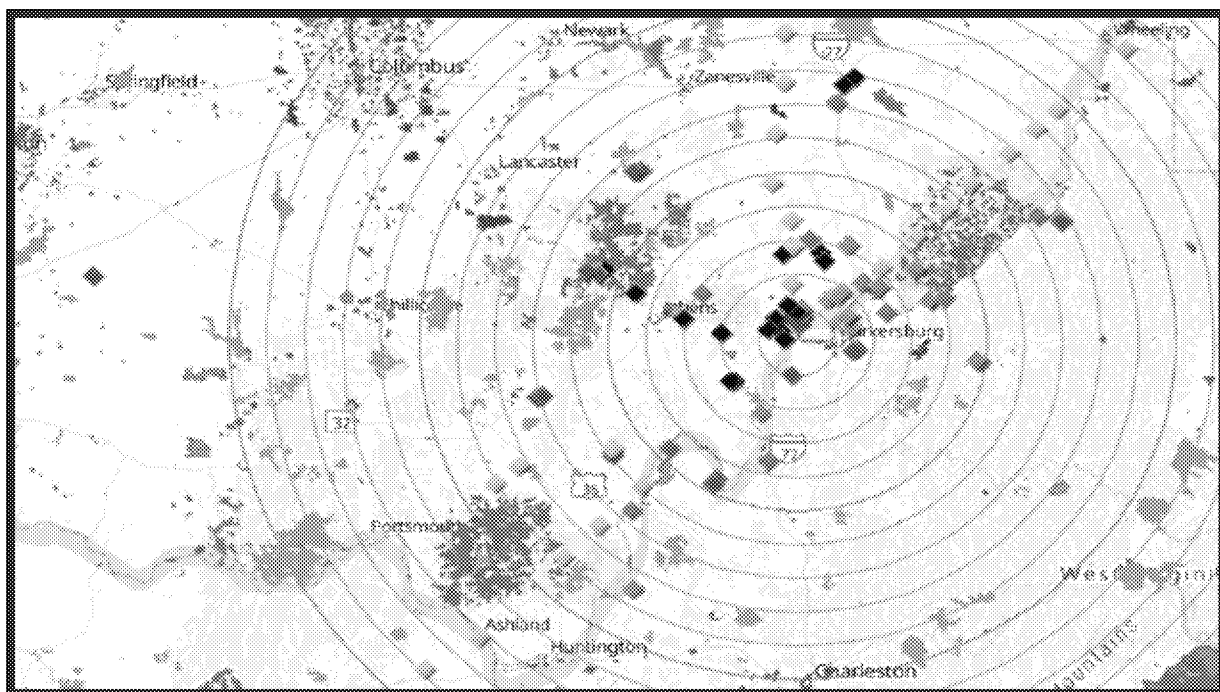
conditions that influence movement of PFAS from soils to surface and ground waters are not well known

It is anticipated that results will be useful in assessing the impacts of PFAS in other contexts and sites

# Project Framework

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- Characterize soil PFAS contamination from air emissions
- Characterize surface and groundwater concentrations and their relationships to areas with documented soil contamination
  - Identify 100 sampling sites for data to be collected
- Develop baseline measurement of other PFAS that may be in waters
  - Two references sites (one OH, one WV) to establish PFAS background
- Evaluate factors and sources that influence PFAS in local environment



Study area = 150 km radius (93.2 mi)  
-shaded areas = govt owned lands  
-diamonds = different sampling points/types

# Study Areas

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- Airborne emissions
- Municipal water systems (>1,000 users)
- Landfills (known and unknown wastes)
- Sewage sludge applications
- Groundwater near contaminated rivers and streams
- Influence from aqueous film forming foams (AFFFs)

1. Determine extent of impacts from airborne emissions

Samples to be collected along two predominant wind directions as far as 150 km from the facility

2. Smaller muni water systems not tested in EPA UCMR3 – 9 total

Serving at least 1000 users

3. We have chosen several landfills that are known to have accepted PFAS wastes, as well as others where the history is unknown.

-Samples will include groundwater from landfill monitoring wells and

-surface water from nearby streams that are both up and down gradient of each landfill

4. All municipal sewage sludge (biosolids) contains PFAS due to the frequent use of PFAS in consumer use items and the potential for PFAS-containing industrial emissions to be discharged to local WWTPs.

-samples will be collected in portions of waterways that are both upstream and downstream of sludge application areas

5. Recharge from adjacent sw contaminated w PFAS can cause long-term contamination to aquifer when the water table is high enough for the surface and gw to interact

6. Used for fire suppression & training in military and fire fighting. We have located a group of sites where AFFF is known or believed to have been used.

## Summary of Project Goals

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- Assess the mobility and transfer rates of PFAS in different media
- Establish a geographical range of measurable impacts
- Help OH & WV with ongoing efforts to identify and remediate PFAS contaminated drinking water resources
- Aid in overall understanding of PFAS contamination and development of mitigation strategies to minimize human exposures

assess the mobility of PFAS from contaminated soils to surface and groundwater resources

Establish a geographical range of measurable impacts from historical airborne PFAS emissions from the WV Chemours facility

Help OH & WV to continue to identify populations that may be exposed to PFAS through drinking water

Help overall understanding + development of mitigation strategies to minimize human exposures

\*\*It is anticipated that results will be useful in other PFAS contamination contexts, for example in other PFAS manufacturing sites or communities affected by AFFF near training sites or military bases